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ABSTRACT

The concept of knowledge utilization and the nature of practical decisions are analyzed to investigate how research knowledge and effective teaching practice are related. It is argued that the personal commitments of teachers, common sense, and normative requirements can also be valid bases for action. The author points out that an over-reliance on research knowledge is unwarranted, for it is time-bound, theory-dependent, and selective. It is suggested that the question of knowledge use in teacher education and teaching can be addressed in its proper context, namely, the striving for practical wisdom. Practical decisions, however, are stated to have a necessary element of arbitrariness, and this arbitrariness that affects teaching practice calls for thought--observation, reflection, experiment, and revision. It is posited that the science of research is organized for the discipline of second thoughts and the quickening of new ones; it is concluded that the quest for knowledge utilization misreads the intelligence of research. The value of research knowledge to teachers and teacher educators, it is stated, lies primarily in the scientific ethos and in processes of inquiry, and only secondarily in the facts researchers lay claim to. (Author/JD)

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Institute for Research on Teaching
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Abstract

How are research knowledge and good teaching practice related? This paper analyzes the concept of knowledge utilization and the nature of practical decisions to consider this question. It argues that the personal commitments of teachers, common sense, and normative requirements can also be valid bases for action. An overreliance on research knowledge is unwarranted for it is time-bound, theory-dependent, and selective. Clarifying irrational assumptions and implications that surround the concept of knowledge utilization, the paper suggests how the question of knowledge use in teacher education and teaching can be addressed in its proper context, namely, the striving for practical wisdom. This context is perplexing because practical decisions have a necessary element of arbitrariness that stems from three sources: lacks of knowledge (e.g., ambiguousness of experience and unpredictability of outcomes); tensions and deficiencies in the moral framework of teaching (e.g., dilemmas or conflicting obligations); and the roots of practice in the quality of wanting. The arbitrariness that affects teaching practice calls for thought--observation, reflection, experiment, revision--as a manifestation of morality. The paper argues that science is organized for the discipline of second thoughts and the quickening of new ones; it concludes that the quest for knowledge utilization misreads the intelligence of research. The value of research knowledge to teachers and teacher educators lies primarily in the scientific ethos and in processes of inquiry, and only secondarily in the facts researchers lay claim to.

THE USE OF RESEARCH KNOWLEDGE IN TEACHER EDUCATION AND TEACHING[1]

Margret Buchmann[2]

To use what researchers have come to know in aiming to improve classroom instruction and school learning seems an unexceptionable goal. Thus teacher educators attempt to give research-based instruction and many hope that teachers will use research knowledge to guide their work. Yet good practice, not truth, is the goal of action, and knowledge utilization and wise action are not the same. Moreover, research knowledge is only a fragment of human awareness--precious, no doubt, but not created for the purposes of action nor sufficient to determine them.

When one considers the contributions of research knowledge to teacher education and teaching, it is important to realize that conventional practice, personal commitment, and external policies (e.g., legal mandates, curriculum guides) can also be valid bases for action. In general, an overreliance on research knowledge will be inappropriate for it is time-bound, theory-dependent, and selective. Beyond that, such overreliance is misguided because problems in the practicing professions do not primarily derive from lacks of knowledge. They arise instead because of tensions or deficiencies in the moral framework in which professional practice is embedded.

Faith in the utility of knowledge derived from scientific inquiry in bringing about change and social reform is a modern phenomenon. Traditionally,

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[1]This paper summarizes and expands previous work (Buchmann, 1982a; 1983a); an earlier version was presented at the 30th International Council on Education for Teaching, World Assembly, Washington, D.C., July, 1983.

[2]Margret Buchmann is coordinator of the Conceptual-Analytic Project, Institute for Research on Teaching, and assistant professor of teacher education, Michigan State University.

action and inquiry were seen as worlds apart, respectively internal and external to ordinary life and perception. Can one live with such a juxtaposition today? If not, what can be done about it? Clearly, these are two issues. Yet people usually go straight to the second one, namely, how to bring thought and action together, taking thought to be research knowledge that is to be brought to bear on practice. A supporting argument might sound like this: The world is rapidly changing and knowledge produced at a pace that is accelerating; therefore, good practice requires using what researchers have learned. But this straightforwardness is deceptive.

Lines of thought and action that draw on collective intelligence and are open to its scrutiny will generally be better than idiosyncratic ones. Therefore it makes sense to require that practicing professionals should attend to public forms of reasonableness. But this does not mean casting research knowledge as the guide or means to effective practice. Student learning can also be improved by teachers' talking about teaching, their looking at their own practice, and by school norms assuming that teaching can always be better than it is. Collegial interaction, reflection, and normative requirements are all based on moral beliefs, specifically, a sense of practical responsibility and professional obligation (Buchmann, 1983b).

What policy makers and educational researchers see as the problem of knowledge use in teaching and teacher education may not be a problem of knowledge creation, diffusion and dissemination, implementation, and evaluation--or a problem of how to bring externally generated knowledge to bear on practice--but rather a *conceptual* problem. For what stands behind the quest for knowledge utilization are problematic assumptions and beliefs about knowledge and action. When knowledge is used, it is seen as a good, but only insofar as it contributes to ends outside of itself. Understanding

research knowledge in terms of utility is a limited and at times unwarranted view of knowledge. When practical judgment is seen as an instance of knowledge utilization, the scope of concerns pertinent to educating people has been reduced to knowledge and utility. This reductionist view of practical wisdom captures neither the realities nor the ideals of teacher education and teaching.

The concept of knowledge utilization implicitly sets policies. Setting policy to improve teaching requires understanding its actual and appropriate grounds. It is my intention to analyze the concept of knowledge utilization, clarifying assumptions and implications that affect what people think and do, and to suggest how the question of using what we know in teaching and teacher education may be addressed in its proper context, namely, the striving for wisdom in practical decisions.

The Concept of Knowledge Utilization

Words and phrases are surrounded by what William James (1890/1950) called "fringes." These fringes connect them with past and future within the universe of discourse to which they belong and surround them with values and implications. What are the roots in thought and time of the conjunction of knowledge and utility in the American republic? The modern conception of knowledge as useful is associated with the rise of the idea that utility is the measure of the good, of what is desirable. In a republic engaged from the beginning in instrumental activity, secular in origin and scientific in orientation, the understanding of knowledge in terms of utility led to a business-like view of action that emphasizes planning, pursuing, procuring, producing, and projecting (see Brann, 1979).

Knowledge Utilization Carries Evaluative and Prescriptive Meaning

Utility itself is a concept that carries (positive) implications of value. According to the *Oxford Universal Dictionary*, utility is the "fact, quality, or character of being useful; fitness for a purpose; usefulness, serviceableness." Thus, if a principal were to make a speech, say, at a school board meeting arguing that some proposal had a lot of utility--meaning thereby to criticize the proposal--the audience would ordinarily not understand what she was talking about. More specifically, utility has to do with convenience or profit and is attributed to objects that satisfy needs. To utilize means to make useful, turn to account; utilization signifies related processes or their results. There are strong economic elements and an emphasis on progress in the concept of utility.

The evaluative meaning of utility is also carried by "to utilize" and "utilization." These terms signify more than the description of a course of action: They connote conduct that is commendable and looks forward to desirable outcomes. Although it appears to be a neutral term, descriptive of what people do or might do, the concept of knowledge utilization is evocative of what people should be doing and what knowledge should be like.

People should use knowledge and, by implication, knowledge should be useful. They ought to put knowledge into practice and operation, hence, knowledge should be constituted so that it can be turned to account. The concept of knowledge utilization involves a normative theory of the relation of knowledge to action in which knowledge serves the purposes of action. On the other hand, action is seen as appropriately tied to knowledge and its use. The expectation is that something good will come of this, exceeding purposes of information or knowing.

Yet one has to consider that practical reason is exercised, non-rigorously, on the particular circumstances of a concrete case--and is therefore twice-

removed from scientific, theoretical thinking. Answers to theoretical questions may legitimately take the shape of "Partly this, partly that . . .," "More likely it is so . . .," or "We have no means of knowing" (Kolnai, 1962). While researchers may feel cozy in the mode of eternal doubt or the divided mind, practical decisions cannot be made in this mode. But this does not mean that other answers--more decisive, less tortuous--can or ought to be given by researchers. It may be fraudulent to do so, and thus of no service to anyone. The fact is that practical decisions and answers to theoretical problems do not stand on the same logical footing.

Concepts that appear to carry straight factual meaning while being surrounded by a halo of values and (irrational) implications are tricky. They seem to commit one to matters of fact only, but can bind one habitually and unwittingly to a range of assumptions. There is nothing wrong with entertaining assumptions, but it is a good thing to know where one makes them and what they are. For, first of all, assumptions must be tenable or capable of being defended against objections. Second, there may be more than one set of tenable assumptions, with what is taken for granted only representing one possible set. Note, for instance, that processes other than utilization--contemplation, critique, or conversation--could be associated with knowledge. In other words, knowledge could simply be enjoyed, it could be criticized or talked about: explored rather than exploited. Where there is no sense of alternatives, the choice of one set of assumptions may go unrecognized and remain hidden. The following discussion further clarifies assumptions about knowledge and action surrounding the concept of knowledge utilization.

What View of Action Does the Concept of Knowledge Utilization Promote?

Knowledge utilization as an account of commendable action stresses means-ends rationality and calculation rather than practical judgment. It pre-

supposes that practical ends are givens, hence a value structure that is fixed. These assumptions are consistent with the concept of utility but conflict with the exercise of practical wisdom.

Knowledge Utilization is No Account of Good Practice

Part of the capacity for judging rightly is giving due weight to evidence and the arguments of others who may offer new data or alternative explanations. Here it can be argued that--even more important than current effectiveness--is the degree to which teachers are susceptible to data and ideas of objective standing: based on student behavior, the advice of colleagues, teacher educators and researchers, the evolving standards of the field, and policy recommendations. There is, however, a difference between reasoning that leads to wise action and reasoning that leads to the truth of conclusions. The difference is that practice is no mode of contemplative knowing, but rooted instead in wanting things and making them happen (Anscombe, 1979).

The quality of wanting calls for thought, as a manifestation of morality. But knowledge is not virtue and action no exercise in using what we know in the pursuit of utility. The truth of scientific theories (where it can be assumed) enters into practical judgment along with other things as one set of items to be considered. The Aristotelian view is that the person of highest practical wisdom brings to bear on a situation the largest number of pertinent concerns. Such concerns are a matter of facts and ideas, norms and personal feelings, and many things besides.

The deliberative search is not, in the first place, a search for means but a search for truly pertinent concerns and the best specification of practical ends (Wiggins, 1978). People ask themselves, "What shall I do?" in

response to some concrete, particular situation that will make circumstantial demands on their practical and moral perception. All pertinent concerns will not be readily apparent, nor will their order be necessarily hierarchical or, for that matter, fixed. Particular situations prompt people to re-order their concerns, keeping alive their sense of the many different points of living and acting. Rarely can they all be attended to; therefore practical decisions tend to leave residues: things that still ought to be done.

In Teaching, Faith May Override Facts

Gaining in practical wisdom means to gain in the ability to specify ends for action in a value structure that is to some extent flexible and open. Truth claims may have to be subordinated to other concerns. Sometimes it is admirable to forge ahead, in spite of the evidence. Consider the example of a warrior. Courage, not foolhardiness, requires that the evil intent of an adversary, the likelihood of being wounded, and past experience of pain shall count for nothing (see McDowell, 1978). It is impossible to give an account of what is in part a deliberate failure to reckon with facts as rational without reference to virtue, here the virtue of courage.

Teaching, too, requires at times that what is known for a fact shall count for nothing. The activities of teaching are predicated upon the belief that a change for the better can be effected in some way through what a teacher does. An equivalent to the Hippocratic Oath for teachers is a commitment to teaching, whatever the prognosis. It is logically (and perhaps psychologically) impossible to take on this moral obligation without some belief that students can learn. Faith in the possiblity of student learning needs to be upheld whatever test scores, talk in the teachers' lounge, or the opinions of parents may imply to the contrary.

Here it is useful to touch on a particular case, that of Ms. Allen, one

of the teachers studied by Carew and Lightfoot (1979). In the eyes of this teacher, "None of the children in her class were intellectually deficient" (p.239)--despite test scores or the results of psychological assessments. Where Ms. Allen felt that test information might interfere with her belief in the capacity of all children to learn, she would ignore it, on occasion spill coffee over it. Part of the point is that Ms. Allen was a very effective teacher by objective measures; her students, for instance, reached high levels of achievement in reading.

Honoring facts can stand in the way of honoring commitments. Of course, honoring commitments can create new facts, such as learning in students taught not to expect it. What practicing professionals do with knowledge held to be relevant to their work needs to be judged in light of values beyond truth. Knowledge may appear useful, given certain ends, but it does not follow that it should always be reckoned with. The use of knowledge can conflict with other ends, such as maintaining a belief in children's capacity to learn.

The concept of knowledge utilization yields a severely and misleadingly edited account of the sources of commendable action. The search for tenable specifications of practical ends cannot be reduced to the calculation of outcomes. Reducing the scope of concerns that bear on practice while focusing on knowledge and utility does not make teacher action more wise. This summary reduction downplays the importance of acting in spite of what counts as the evidence, or inspired by ideals that people *know* cannot be realized in full. (Yet acting in light of aims that one has never seen accomplished or that one cannot expect to actually reach is not irrational.) And it assumes more than is justified about knowledge and its contribution

to commendable action in classrooms and achools. But the emphasis on knowledge and utility as bases of action not only evokes an incomplete and distorted account of practical wisdom, but a misleading account of knowledge as well.

What View of Knowledge Does the Concept of Knowledge Utilization Promote?

The place of knowledge in the scientific ethos explains why the concept of knowledge utilization is so appealing to researchers. People whose life is tied up with knowledge are likely to regard knowledge as important. If they live in a culture that sees utility as the end toward which everything gravitates, researchers may regard what they know as useful, irrespective of the degree to which it actually is. By its association with utility, furthermore, knowledge gains in authority. This is not to say that knowledge *cannot* be trustworthy or useful. However, research knowledge is probably useful for social problem-solving much less frequently than people, including scientists, believe. Thus Frankel (1973) observes,

> Considerable damage . . . has been done by scientists, among whom social scientists are perhaps the most notable, who exaggerate the amount of sound and applicable knowledge they have and who offer confident solutions to social problems--solutions that, when tried, turn out to be only a mixture of pious hopes and insular moral judgments. (p. 391).

Nisbett and Ross (1980) warn scientists--especially in their role as social advocates--as well as laypersons against committing the fallacy of misplaced certainty. People need to recognize that their interpretations of events are inferences based on theory, rather than simple read-outs of data, and that the same data can easily support different interpretations when viewed from the vantage point of other theories. But social expectations and the pursuit of utility can undercut scientific wariness and tempt researchers to say more than they know: in their capacity as scientists, and given the mores of science. In any other capacity, they stand on a par with other people--bricklayers, grandmothers, children, and magicians--unless, of course, proven otherwise.

Implications and Applications: Begging the Question of Usefulness

Using the terms "implication" and "application" is a particularly troublesome language habit in this context. Briefly and strictly speaking, nothing is implied in research findings beyond the questions that may be answered by the research and, possibly, other questions to which the research is related by the intellectual and social traditions of research communities (Ben-David, 1968). "Applications" are neither deducible nor logically implied; they depend instead on moral frameworks and networks of power and authority that affect the work of practitioners, as well as on legal and political knowledge and (importantly) know-how.

It is instructive to take a look at the terms themselves. Implications have binding force for reasonable people. Taking issue with what is comprised or involved by nature or meaning in a statement, as a necessary logical consequence, is being foolish or capricious. Where one is sure of one's premises, conclusions drawn from them in due form are not mere assertions or problematical statements, but absolutely demonstrable and incontrovertible (i.e., of apodictic nature). Something called applicable, on the other hand, is already deemed fit or suitable for a purpose. Speaking of applications assumes that scientific findings imply lessons for practice like the moral of fables in which lions and foxes speak moved by human passion. Of course, useful lessons are contained in these moral tales, which are short stories not founded on fact and devised to teach such lessons by illustrating a single precept with humor and common sense. (And if it were more fable-like, or at least story-like, research would be more applicable.) Yet it is presumably its non-fable-like character that lends science its compelling voice, and one cannot have it both ways. The terms "implication" and "application" assume what needs to be demonstrated, thus begging the question of the uses of knowledge for practice. As potent rhetorical evocations, they also

reinforce mistaken perceptions of the relations that research knowledge and good teaching practive may have.[3]

Assuming Applicability Means Assuming Soundness

In general, the concept of knowledge utilization downplays the fallibility of knowledge. Researchers are no exceptions to the rule that, once asked, people do not like to say that they have no opinion to give. Embedded in the social situation of giving advice are incentives to say something and, having started, to deliver oneself with an air of conviction and well-founded knowledge. Who would offer or accept knowledge as "ready for use" that comes labeled as, "our best attempt, provisional and limited; deteriorates fast, please treat with caution"? It is almost impossible to give advice while scrupulously stressing the fact that one offers it on slight grounds--which may be affected through alterations of social reality even while one is talking.[4]

It is equally impossible to go ahead with an undertaking while maintaining that one's grounds for action are uncertain and weak. In order to act people need to put trust in what they know. Thus, for example, in making decisions, physicians tend to overestimate the soundness of available knowledge (Elstein, Shulman, & Sprafka, 1978; Freidson, 1970). But need and

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[3]See Barnes (1982), Ben-David (1968), Holzner (1983), Zumwalt (1982), and Phillips (1980) for an elaboration of the points raised here from the perspectives of sociology of science and knowledge, philosophy, policy-making and teacher education. (For a related discussion of the utility of mathematical methods for the conduct of trials, see Tribe [1971].) In considering the uses of research knowledge for practicing professions, the language habits of talking about "implications" and "applications" need further examination.

[4]Thus using knowledge effectively already speeds up the decay of related generalizations, for "the knowledge with which we achieved this alteration of the world has been made a little obsolescent. . . ; the world reflected in its purport is not quite the same as that which now exists" (Schwab, 1978; p. 136).

affect do not convert into truth values. To the contrary, that something is close and important to people can make them less able to judge in accordance with fact and good sense (Nisbett & Ross, 1980). In sum, there are inherent relationships between assuming applicability and soundness which are not epistemically derived (i.e., based on characteristics of knowledge and processes of knowing), but a function of psychological and social factors that operate independently of the degree to which knowledge is, in fact, trustworthy and relevant to action.

One cannot ask a practical question seriously without wanting to acquaint oneself with facts and ideas, for people cannot but want to make wise, better still, happy choices. Yet something is not true or reasonable just because one takes it to be so. Thus in thinking about knowledge and practical decisions, one should be (suitably) broad-minded but must maintain requirements for justification. Upholding a belief that children can learn is usually justified. But sticking to what is mere opinion, false or irrelevant, will not lead to wise action.

Assuming Fallibility Helps Toward Right Action

Teaching means by definition taking an interest in student learning. Beyond this, the indubitable is scarce in education. Consider, for example,

> the proposed ends and methods of instruction in some of their difficult, tangled, and doubtful connections with the imperfect and incomplete researches on society, the learning process, human personality and similar topics. (Schwab, 1959, p. 148)

In part, good practice is the art of responding to urgency where there is want of perfect certainty and outcomes are unpredictable. But there is a difference between taking something to be a serious possibility to which one commits oneself in thought and action and *not* changing one's policies when practical and epistemic circumstances change (Levi, 1980).

People do not act on what they believe to be false at that time. Yet the need to confidently assume some things in action does not imply taking for granted some unalterable certainty.

Nowhere should the difference between serious possibility and incorrigible certainty be more keenly felt than in schools, places where change is an institutional mission and that swarm with young people. Its moral import derives from the fact that teachers in their separate classrooms hold social and epistemic authority in conjunction, having the final say on what is justified belief as an underpinning for classroom procedures and the enacted curriculum (Buchmann, 1982b). Without a distinction between serious possibility and incorrigible certainty the concept of knowledge is not only meaningless but likely to have deleterious effects on practice.[5] Making this distinction acknowledges the practical need for certainty as an inherent feature of knowledge use (which also characterizes knowledge use in inquiry), while shifting the grounds of epistemic authority away from privileged access to knowledge--personal, practical, or scientific--to processes by which beliefs can be corrected and revised.

Knowledge must not be confused with the comforts of settled opinion. Trust and doubt are the two faces of knowledge use. For, one cannot use knowledge without putting trust into it, and its days as knowledge--justified belief--are counted where trust is complete and unquestioning. The hesitation to trust is realized in observation, reflection, experiment, and

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[5]Some educational researchers have long noted this. Thus Brophy and Good (1974) stress in their discussion of the "self-fulfilling prophecy" in classrooms: "If a teacher accurately perceives a student to be a low achiever, *and if he sees this as permanent and unchangeable*, he will be relatively unsuccessful in teaching the student. Thus teacher expectations do not have to be inaccurate (as implied in the usual definition of self-fulfilling prophecies) to affect students. Their degree of flexibility, or openness to being changed in response to new data, is even more crucial than their initial accuracy" (p. 35; emphasis in the original).

revision: second thoughts that, on the whole, tend to be better than first ones.

The Concept of Knowledge Utilization: Empirical Side-Effects

Scientific authority is based on competence in inquiry, which means seeking and asking, not answering and prescribing. The tentativeness of (research) knowledge is like a safety catch that a pretension to usefulness tends to remove. This is so, in particular, because the public accepts scientific findings not because it shares the scientific conception of reality, but because of the social authority of science. Scientific knowledge and judgment are opaque and indisputable for most people. Yet the knowledge utilization market is an unlikely place for appraising the grounds of knowledge claims. Critical reflection on the grounds of belief and on the adequacy of knowledge claims is not an activity at which practical reason is likely to excel. Once scientifically legitimated concepts and the practices they engender have come into circulation, they may persist, regardless of the degree to which they are worthy of adherence. Thus the quest for knowledge utilization may turn innocuous theorizing into folly that lasts.

The quest for knowledge utilization creates empirical conditions in which the language of inquiry and the language of political and social authority are confounded with each other (Edelman, 1975). Ironically, this confusion and the faith in knowledge prevalent in the American culture can mask the inappropriateness and inefficacy of policies that aim at both researcher and practitioner communities.

Knowledge Utilization Can Erode Bases for Good Practice

When researchers speak as if their specialized and metaphorical language was the language of reality, this diverts attention away from

other sources of knowledge and grounds for action, relegating to the irrational most everything by which people determine and decide what to do: values (duty and enjoyment), ends, and commitments. What also drops out of consideration is almost all knowledge possessed by ordinary people. Yet people are enabled to do a great many things by knowledge that is neither based on research nor codified in books or computer memories. A preference for research-based knowledge and animus toward other possible sources of knowledge may simply result in eliminating good practices and ideas. The obverse fallacy is to take anything as knowledge on which someone is willing to act, although this point of view also has its proponents. Thus in their well-known work on knowledge use and social problem-solving, Lindblom and Cohen (1979) assert that, "Whether it is true or false, knowledge is knowledge to anyone who takes it as a basis for some commitment or action" (p.12), and make clear that they will call it knowledge even if if is false.

However, not all knowledge claims are of equal merit nor all personal and social constructions of reality true. Not all views of teaching and teacher education are equally tenable images of professional work and capable of sustaining good practice. Nor do sheer power and strength of persuasion make changes in the moral framework surrounding the profession of teaching--such as the recent and historically recurrent call for excellence in education--defensible. We must still ask, What is happening to all children in schools? Failing to uphold the distinction between descriptive accuracy and persuasive bias means eroding the basis for reasoned talk and decision in education.[6]

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[6]It also depletes the resources of out-of-power minorities who, on occasion, are able to advance their goals and social justice by speaking truth to power (Campbell, 1982).

Knowledge Utilization Can Lead to Manipulation of Beliefs

Scientists and ordinary people are not so differently placed as long as knowledge is seen as indirect, based on assumptions and incompletely corroborated at best. Both groups are, however, differently placed in that, by the definition of their work, practicing professionals cannot avoid situations that prompt them to overestimate the soundness *and* applicability of available information. Whatever the state of knowledge, practitioners have the responsibility for good practice. Yet when researchers enter, for instance, the social situation of giving advice, this is not a matter of necessity but choice. It certainly is not part of the definition of inquiry, and gives researchers a stake in reality that does not come with their territory.

In this fashion, the concept of knowledge utilization may encourage borrowing the authority of science for interested purposes. Thus Merton (1942) argues that "the possibility of exploiting the credulity, ignorance and dependence of the layman" (p. 125) is considerably reduced where scientists and the public stay well apart:

> To the extent that the scientist-layman relation does become paramount, there develop *incentives for evading the mores of science*. The abuse of expert authority and the creation of pseudo-sciences are called into play *when the structure of control exercised by qualified compeers is rendered ineffectual*. . . .[Scientific] authority can be and is appropriated for interested purposes, precisely because the laity is in no position to distinguish spurious from genuine claims to such authority. (p. 125; emphasis added)

And it is not only laypeople who can be duped by discussions in the social and political arena, where manipulation of beliefs and obfuscation of issues are operating goals of discourse. Researchers unaware of these goals are not well equipped to cross borders either and can make themselves unwitting conspirators in a mystification that may serve, if not their own, then other special interests. As Campbell (1982) put it, "the role of the researcher

as consultant rather than actor guiding his own actions maximizes the belief manipulation interest in research reports" (p. 334).

Scientists have responsibility for the pursuit of truth; the ethos of science is probably its greatest social asset. Scientific mores are institutionalized in methods and procedures as well as in norms for behavior and mental conduct that shape the personal identities of researchers. These mores will loosen their hold on researchers to the extent that they move from the theoretical to the practical realm, thus losing their principal foothold in society at large.

Knowledge Utilization Can Interfere with the Pursuit of Knowledge

In its processes and mores, science is organized for the discipline of second thoughts and the quickening of new ones, both vital processes. These new thoughts are not about

> the "actual" interconnections of "things" but the *conceptual* interconnections of *problems* which define the scope of the various sciences. A new "science" emerges where new problems are pursued by new methods and truths are thereby discovered which open up significant new points of view. (Weber, 1904/1963, p. 371; emphasis in original)

On the one hand, scientific communities require and reward reiterated knowledge testing. In the mode of eternal doubt, researchers are busy policing knowledge claims, whatever their source. This makes research seem an uninspiring, slow, and backward-looking process, easily outflanked by ideologies and structural or technological changes that create new social facts. But on the other hand, science looks forward to new things to know, to be ready to meet them. In the mode of creation, science gives speed to new problems and ways of knowing; it, therefore,

> must race ahead of practical problems posed and do without their aid. It must be unchained from past experience, even from the present. It must go on "for its own sake," for the future. (Schwab, 1959, p. 152)

To the extent that science remains tethered to practical problems, it cannot do the job of seeking after new experience in which knowledge is deliberately organized to lead the way into the unknown.[7]

Neither the mode of eternal doubt nor that of bold conjectures give more practically useful structure to what is already known. And however far theory may race ahead of past and present, it cannot give advance legitimacy to action. To increase competence in responding to urgency where there is want of certainty, we need openness to new thoughts and data, and a sense of practical responsibility. To increase competence in inquiry, researchers must go after their fixations, intuitions, and solutions to logical problems, worthwhile because of an inherent intellectual promise. The quest for knowledge utilization may interfere with both processes of reiterated knowledge testing and the pursuit of knowledge that is new. It may, in sum, not only detract from people's capacity to act wisely, but from the scientific and social purposes of knowing as well.

So What Remains?

There still remains the social problem of improving practice and practical wisdom in teaching. But this, and not the use of knowledge, is the difficult and puzzling question that calls for consideration. Thus a more fruitful approach to what seems to be the problem of knowledge use in teacher education and teaching can be derived from putting it back into its originating context. This context is the *practical*, in the full sense that comprises ethics, artfulness, and habit (Schwab, 1959).

This context, then, will suggest the proper place and terms for a

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[7]Practical or applied knowledge may indicate needs for new basic knowledge and clues for pursuing it (see Machlup, 1980). But engaging in this pursuit then requires the system of incentives, controls, and dispositions identified with scientific communities.

discussion of knowledge use in teacher education and teaching--immediately dispelling the notion that using what we know is an end in itself in teaching or a solution to problems of practice. Put differently, if knowledge use or generation were the solution, improving practice could not be the problem.

It is true, though, that lacks of knowledge make teaching more difficult Beyond the general imperfection of knowledge (i.e., its being tentative, time-bound, and selective), troublesome lacks of knowledge include the facts that experience is ambiguous and that things can turn out variously in teaching. But note that the certainty wanting here cannot be supplied by research knowledge. Practical decisions accordingly lead people to assume too much and call for revising assumptions in retrospect. Yet what is done is done; only the thought of it can be changed.

Hence what matters is what the act is: what it is like, what it is for, what it changes or leaves as it is, and what comes of it for teachers and students. However, though the point of what people do in teaching is clearly dependent on outcome, it cannot be accounted for by outcomes alone. Principles and ideas give meaning to teaching practice, and where they do so, they ring true to oneself *subjectively*.

> The agent's own primary concerns are the only possible principles of his practice, for he cannot succeed or fail except in what *is* his endeavor, nor adopt objective principles except by references to things he actually wants already. (Kolnai, 1962, p. 211; emphasis in original)

Practice is personal because action commits people and is ineluctably one's own. This brings the complication that usable knowledge must somehow be *close* to people; they must be able to grasp it. (This is no small matter, as it presupposes either that knowledge already fits personal understandings or that, in grasping it, there is a change of mind.) From the point of view of truth, these non-cognitive extras are not only irrelevant but sources of inferential and judgmental error (Buchmann & Schwille, in press).

But if feedback from data, for instance, were clear and outcomes predictable, people would still have reason to be perplexed. For practical problems do not come inscribed with pertinent concerns and charts of weights and relations attached. The perplexing nature of practical decisions does not stem from their uncertain and intricate character alone, but from an intractable circularity. People *weight* what they are weighing before considering the balance (Kolnai, 1962). It is an illusion to think of practical decisions as handling objectively fixed weights. People are never utterly surprised by what they come up with; weighing concerns anticipates--vaguely but hopefully--certain results and not others.

Practical decisions have the intrinsic imperfection of operating with loaded dice. This imperfection is tied to the nature of practice as personal action. Moreover, actual purpose formation waits on occasions and suggestive influences that happen to cross one's path. The influx of concerns does not end with decisions but goes on in action, which is swayed by what it finds. Events suggest new and different concerns, and opportunities precipitate choices. One might say that practical decisions operate not only with loaded but with tumbling dice.

Finally, pertinent concerns in teaching routinely turn up in pairs of obligations where, if one is satisfied, the other cannot be. Paying attention to one student (for good reasons) does not make the obligation to attend to the whole class disappear. Philosophical and empirical analyses suggest that dilemmas--if they cannot be avoided--are "resolved" in a serial process that bypasses one horn of the dilemma and deals with residues later (Lampert, 1981; Marcus, 1980). Hence principles of conduct that apply to dilemmas are only regulative. They address the situational management of concerns and do not get rid of conflicts between obligations.

Small wonder, then, that research knowledge cannot deliver guarantees on good practice in teacher education and teaching. But neither can any other form of knowledge--personal, practical, scientific--or insights, commitments, and norms by themselves. We need contributions from all these domains and, in addition, humor and common sense to advance practical wisdom in the teaching profession. Also, acts of romantic irresponsibility (e.g., spilling coffee over test results) sometimes do result in happy choices.

In all of this, the single most important insight is that the necessary element of arbitrariness in teaching practice makes second thoughts--and new thoughts--imperatively necessary or of the nature of duty. As I have argued, arbitrariness stems from lacks of knowledge, tensions and deficiencies in the moral framework of teaching and the roots of practice in the quality of wanting. Teacher decisions are therefore tentative acts of willing, inchoate and uncertain in a way that the imperfect knowledge of science is not. And this may be one of the reasons why people turn to research knowledge in education, though it does not follow that the hopes they place in this knowledge are well founded.

Science is the discipline of new and second thoughts. Its value to teachers and teacher educators lies primarily in the scientific ethos and processes of inquiry, and only secondarily in the facts researchers lay claim to. Given this, the rhetoric of conclusions, implications, and applications is unfortunate. In appealing to the authority of science, it misreads the intelligence of research and confuses the issues.

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